



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/621,768	07/21/2000	Blair A. Barbour	P43-5007	4912

116 7590 08/01/2003

PEARNE & GORDON LLP  
526 SUPERIOR AVENUE EAST  
SUITE 1200  
CLEVELAND, OH 44114-1484

EXAMINER

HESELTIME, RYAN J

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 08/01/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/621,768

Applicant(s)

BARBOUR, BLAIR A.

Examiner

Ryan J Hesseltine

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement, paper number 4, filed July 21, 2000 has been considered. The examiner has corrected the document number of the third US patent document to Lu on form PTO-1449 to correspond to the copy that was received (PN 4,585,000 to PN 4,858,000).

### ***Oath/Declaration***

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the provisional applications on which priority is claimed pursuant to 35 USC 119(e), by specifying the application number, day, month and year of its filing.

### ***Claim Objections***

3. Claim 16 is objected to because of the following informalities: Claim 16 depends from claim 13, which depends from claim 1. Claim 16 is substantially the same as claim 3, which also depends from claim 1. While this dependency is legal, it is believed that applicant intended claim 16 to depend from claim 14 since claim 15 depends from claim 14. Appropriate correction is required.

4. Claim 19 is objected to because of the following informalities: line 1 states, "A *method* for information extraction," while line 3 states, "said *apparatus* comprising:" (emphasis added). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

Art Unit: 2623

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-5, 7-14, 16, and 19-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Barbour et al. (USPN 5,890,095, cited on applicant's IDS), hereafter Barbour.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

7. Regarding claims 1 and 19, Barbour discloses an apparatus and method for information extraction from electromagnetic energy via multi-characteristic spatial geometry processing (column 1, line 6-11), said apparatus/method comprising: means (collection means 52) for receiving electromagnetic energy from a source, the received electromagnetic energy having a plurality of spatial phase characteristics (column 7, line 41-49); means for separating (filtering) the plurality of spatial phase characteristics (polarizations) of the received electromagnetic energy (column 3, line 62 to column 4, line 22, line 39-50); means for identifying spatially segregated portions (pixels) of each spatial phase characteristic, with each spatially segregated portion (pixel) of each spatial phase characteristic (polarization vector) corresponding to a

Art Unit: 2623

spatially segregated portion (pixel) of each of the other spatial phase characteristics (polarization vectors) in a group (super pixel; column 5, line 41-62; column 7, line 59-67); and means for quantifying each segregated portion (pixel) to provide a spatial phase metric (pixel value) of each segregated portion (pixel) for providing a data map (image) of the spatial phase metric (pixel value) of each separated spatial phase characteristic (polarization vector; column 7, line 41-67; column 8, line 35-45).

8. Regarding claims 2 and 22, Barbour discloses that said apparatus is an imaging apparatus for providing an image of an object as the source (column 5, line 28-40), and includes means for determining an imaging value associated with each group of corresponding segregated portions (pixels) using the spatial phase metrics (column 5, line 41-49), and means for assembling an image of the object using the determined imaging values (column 7, line 53-67).

9. Regarding claims 3, 16, and 23, Barbour discloses that the spatial phase characteristics of the electromagnetic energy include polarization characteristics of the electromagnetic energy (column 1, line 6-11; column 5, line 41-49).

10. Regarding claims 4 and 24, Barbour discloses that said means for providing a data map includes providing the map to indicate spatial phase change (column 5, line 50-67).

11. Regarding claims 5 and 25, Barbour discloses that said means for quantifying each segregated portion (pixel) to provide a spatial phase metric (polarization) includes associating an information value (polarization vector, pixel value) with each segregated portion (column 7, line 59-67).

12. Regarding claim 7, Barbour discloses that said apparatus is a single view imaging apparatus (standard video camera) for providing an image of an object as the source, and

Art Unit: 2623

includes means for determining an imaging value associated with each group of corresponding segregated portions using the spatial phase metrics (see above discussion of claim 2), and means for assembling a three dimensional image representation of the object using the determined imaging values (column 9, line 56-65).

13. Regarding claim 8, Barbour discloses that said means for assembling a three-dimensional image representation includes means for using determined values representative of slope functions (angle of incidence, 3-D shape, object orientation) of the object (column 9, line 56-65).

14. Regarding claim 9, Barbour discloses that said means for assembling a three dimensional image representation includes means for using determined values representative of surface (3-D) shapes of the object (column 9, line 56-65).

15. Regarding claim 10, Barbour discloses that said means for assembling a three-dimensional image representation includes means for using determined values representative of surface contour (angle of incidence, 3-D shape, orientation) of the object (column 9, line 56-65).

16. Regarding claim 11, Barbour discloses that said apparatus is an imaging apparatus for providing an image of an object as the source, and includes means for determining an imaging value associated with each group of corresponding segregated portions using the spatial phase metrics (see above discussion of claims 2 and 7) and indicative of material composition of the object associated with each group of corresponding segregated portions, and means for assembling an image representation of the object indicative of material composition using the determined imaging values (column 9, line 56-65).

17. Regarding claim 12, Barbour discloses that said apparatus is an imaging apparatus for providing an image of an object obscured by an electromagnetic energy scattering media

Art Unit: 2623

(detection through a dispersible medium) that permits a minimal amount of electromagnetic energy passage (radiation is scattered) and includes means for determining imaging values (column 7, line 59-67) from the minimal amount (reduce scattered radiation, thus increasing the detection range) of electromagnetic energy (column 9, line 37-41, line 66-column 10, line 12).

18. Regarding claims 13 and 26, Barbour discloses that said apparatus is a communication apparatus (column 9, line 5-7, 17-21) and said means for quantifying each segregated portion to provide a spatial phase metric includes determining an information value from each segregated portion (column 7, line 59-67).

19. Regarding claim 20, Barbour discloses processing the spatial phase metrics (polarization vectors) to derive information (column 8, line 15-42).

20. Regarding claim 21, Barbour discloses that said step of separating includes discerning a three-dimensional shape aspect of the ellipsoidal shape of the electromagnetic energy (column 9, line 56-65).

21. Regarding claim 27, Barbour discloses processing all spatial phase metrics to derive information (column 4, line 23-26; column 7, line 41-45).

22. Regarding claims 14 and 28, Barbour discloses an imaging apparatus and method of creating an image comprising: means (collection means 52) for receiving electromagnetic energy proceeding from an object; and means for creating an image of the object utilizing only spatial phase characteristics (polarization) of the electromagnetic energy proceeding from the object (column 6, line 24-43; column 7, line 41-67).

***Claim Rejections - 35 USC § 103***

Art Unit: 2623

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

24. Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barbour as applied to claim 1 above.

25. Regarding claim 17, Barbour discloses an imaging apparatus comprising: means (collection means 52) for receiving electromagnetic energy proceeding from an object; and means for creating an image of the object utilizing spatial phase characteristics (polarization) of the electromagnetic energy proceeding from the object (column 6, line 24-43; column 7, line 41-67). Barbour does not explicitly disclose that the electromagnetic energy conveys insufficient characterization in the visible and infrared spectrums to permit viable intensity-based and/or frequency-based image creation, but it is disclosed that the spatial phase sensor provides for electromagnetic radiation signals across the electromagnetic spectrum to be enhanced. Therefore, if there were an insufficient characterization in the visible and infrared spectra, the spatial phase sensor of Barbour would be capable of measuring/enhancing radiation in other parts of the electromagnetic spectrum. It would have been obvious to one of ordinary skill in the art at the time the invention was made to receive electromagnetic energy which conveys insufficient characterization in the visible and infrared spectrum as taught by Barbour in order to provide for electromagnetic radiation signals across the electromagnetic spectrum to be enhanced (column 7, line 41-45).



Art Unit: 2623

26. Regarding claim 6, Barbour does not explicitly disclose that the electromagnetic energy conveys insufficient characterization in the visible and infrared spectrums to permit viable intensity-based and/or frequency-based image creation, but it is disclosed that the spatial phase sensor provides for electromagnetic radiation signals across the electromagnetic spectrum to be enhanced (see above discussion of claim 17).

27. Claims 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barbour as applied to claim 14 above, and further in view of Oshige et al. (USPN 5,311,285, cited on applicant's IDS), hereafter Oshige.

28. Regarding claim 15, Barbour does not disclose whether or not said means for receiving and said means for creating include components that move relative to each other. Oshige discloses a measuring method for ellipsometric parameters wherein the beam, which is elliptically polarized and reflected by the sample surface, is divided into four different polarized components by stationary optical elements and no moving members are required. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize means for receiving and means for creating including components that do not move relative to each other as taught by Oshige in order to reduce the size and weight of the unit as a whole allowing installation in a narrow place, which increases the applicability of the device (column 9, line 49-64).

29. Regarding claim 18, Barbour discloses an imaging apparatus comprising: means (collection means 52) for receiving electromagnetic energy from an object (column 7, line 46-58), the received electromagnetic energy having a plurality of polarization characteristics (column 5, line 41-49); means for separating (filtering) the plurality of polarization

Art Unit: 2623

characteristics of the received electromagnetic energy (column 3, line 62 to column 4, line 22, line 39-50); means for creating a plurality of images (super pixels), each image (super pixel) having a plurality of pixels, with each pixel of each image (super pixel) corresponding to a pixel of each of the other images (super pixels) in a group (column 5, line 41-62; column 7, line 59-67); means for quantifying a polarization metric value (vector) at each pixel of each created image; means for determining an imaging value associated with each group of pixels using the quantified values; and means for assembling an image using the determined imaging values (column 7, line 41-67; column 8, line 35-45).

30. Barbour discloses forming a plurality of pixels in predetermined patterns (super pixels) with each pixel having different polarization vectors, but does not disclose that each image is created using one of the separated (filtered) polarization characteristics (vectors). Oshige discloses that a beam reflected from a measurement target is divided into four different polarized light components (column 6, line 33-68), which are converted into digital values (images) from which ellipsometric parameters are calculated (column 7, line 4-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to create a plurality of images each having different polarization characteristics as taught by Oshige in order to simultaneously measure and sequentially capture different polarization characteristics of one reflected light beam in a timely manner, even if the sample moves at high speed (column 7, line 20-32).

### ***Conclusion***

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2623

- USPN 6,026,173 to Svenson et al. discloses an electromagnetic imaging and therapeutic (EMIT) system including a tissue-type parameter to detect anatomical structure by measuring transmitted electromagnetic energy.
- USPN 6,490,471 to Svenson et al. discloses an electromagnetic imaging and therapeutic (EMIT) system including simultaneously obtaining 32 scattering patterns, irradiating an object with vertically polarized light, and combining a 3-D microwave tomographic system with a 3-D electrical impedance.
- USPN 6,384,916 to Furtak discloses parallel detecting, spectroscopic ellipsometers/polarimeters having no moving parts and operating in real-time to separate light reflected from a sample into four separate polarized filtered beams.
- USPN 6,055,053 to Lesniak discloses full field photoelastic stress analysis including illuminating a specimen with circularly polarized light requiring no moving parts.  
USPN 5,424,536 to Moriya discloses a substrate internal defect and external particle detecting apparatus using s-polarized and p-polarized light.
- USPN 5,080,486 to Shirasaki et al. discloses spectrum-measuring equipment utilizing a double-image polarizing element.
- USPN 4,869,593 to Biegen discloses an interferometric surface profiler including measuring the topography of a test surface with a polarizing, optically isolating beamsplitter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan J Hesseltine whose telephone number is 703-306-4069.

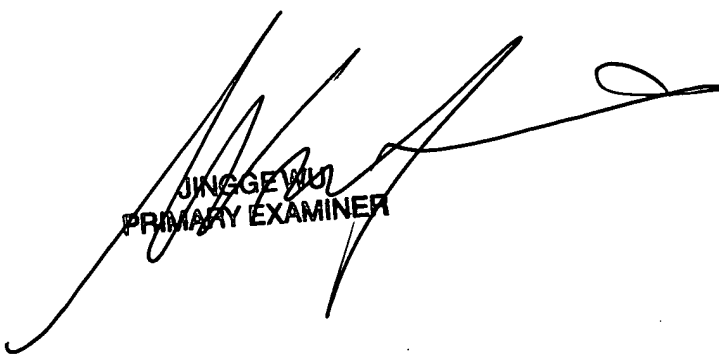
The examiner can normally be reached on Monday - Friday, 8 AM - 4:30 PM.

Art Unit: 2623

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

rjh  
July 24, 2003



JINGGE WU  
PRIMARY EXAMINER